(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: 0 298 943 A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 88850242.4

(22) Date of filing: 06.07.88

(51) Int. Cl.4: F 01 N 3/28
B 01 J 35/04

(30) Priority: 06.07.87 SE 8702771

(43) Date of publication of application:
11.01.89 Bulletin 89/02

(84) Designated Contracting States:
BE DE ES FR GB IT NL SE

(71) Applicant: SVENSKA EMISSIONSTEKNIK AB
S-445 01 Surte (SE)

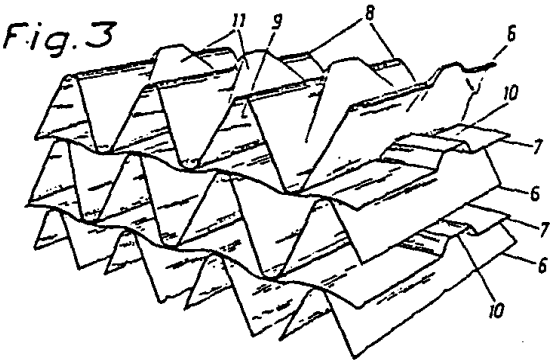
(72) Inventor: Nilsson, Sven
Smakullevägen 18
S-430 50 Kallered (SE)

(74) Representative: Ferkinghoff, Claes-Göran et al
ALFONS HEDBERGS PATENTBYRA AB
Aschebergsgatan 35
S-411 33 Göteborg (SE)

(54) A catalyst carrier.

(57) A catalyst carrier (3) comprising two superposed webs (6, 7) of material which are wound about a core sleeve. One (6) of the webs is provided with transverse ridges (8) forming channels (9) which extend axially through the carrier. The other web (7) is provided with ribs (10) which cooperate with indentations made in the ridges (8) in the first web (6), whereby the webs (6, 7) are mechanically locked to each other.

Fig. 3



EP 0 298 943 A2

being indicated by arrows,

Fig. 5 is a view similar to Fig. 4 but showing a channel in the catalyst carrier in accordance with the invention, and

Fig. 6 illustrates on a considerably enlarged scale a section through the wall of a channel having a layer of a porous carrier material deposited thereon.

The embodiment illustrated in the drawings concerns a catalytic converter 1 which is designed to purify the exhaust gases from a gasoline fuelled vehicle motor. The catalytic converter 1 consists of an elongate housing 2 in which is mounted a catalyst carrier 3 in accordance with the invention. The housing 2 is provided at its ends with fittings 4, 5, one of which is an inlet 4 and the other one an outlet 5.

Fig. 3 illustrates the structure of the catalyst carrier 3 in accordance with the invention. For purposes of clarity, the normally curved shape of the carrier has been straightened. The carrier consists of two webs 6, 7 of material which are wound in superposed relationship. One, 6, of the webs is formed with transverse ridges 8 defining channels 9 which extend axially through the catalyst carrier 3, the latter being formed as a roller, whereas the other web, 7, is formed with lengthwise ribs 10. The ridges of the first web are provided at their tops as well as at their bottoms with indentations 11 having the same pitch as the ribs 10 formed in the second web 7 of material. When the two webs 6 and 7 of material are wound in superposed relationship the indentations 11 will engage in the ribs 10, thus establishing a mechanical bond which interlocks the two webs. Consequently, expensive welding operations to secure the structure of the catalyst carrier 3 in accordance with the invention are made redundant. The finished catalyst carrier 3 is submerged in baths containing respectively catalyst carrier material and catalytically active material and the carrier is then mounted in a housing 2.

Another important advantage found in the catalyst carrier 3 in accordance with the invention appears from the drawing figures 4 and 5 which are broken perspective views of an individual channel 9 in a catalyst carrier, Fig. 4 shows a channel of conventional design and Fig. 5 a channel designed in accordance with the invention. In both drawing figures arrows indicate the path of the gases through the channels 9.

Inside the conventional channel shown in Fig. 4 the major part of the gases pass through the channel 9 in essentially straight flows paths without contacting the catalytically active material on the channel walls. The result is poor catalytic function. Inside the channel in accordance with Fig. 5, on the other hand, the ribs 10 create a turbulent flow which is generated without any noticeable area reduction of the channel 9 because the indentations 11 are positioned in alignment with and above the ribs 10. Owing to the turbulent flow no laminar boundary layer is formed which would come between the gas flow and the walls of the channel 9. The resulting increase of efficiency in turn means that a catalytic converter 1 incorporating a catalyst carrier 3 in accordance with the invention may be a great deal more compact than catalytic converters having catalyst carriers of conventional design. In addition to making it easier to mount catalytic converters in accordance with the invention in e.g. the exhaust system of motor vehicles, the most important advantage is the considerable savings in catalytically active material used by each catalytic converter that the design in accordance with the invention makes possible, which savings reduce the manufacturing costs considerably.

In order to further stress the importance of the turbulent flow provided by the catalyst carrier in accordance with the invention Fig. 6 illustrates schematically a channel wall 12 on which is deposited a porous carrier material 13 serving to support the catalytically active material thereon. (It should be noted that the the wall section and the carrier material are shown on a highly enlarged scale, the thickness of the carrier material layer actually being in the order of 5 to 15 μ). Because of the porous structure of the carrier material consisting of deep pores it is highly advantageous if the gases flowing through the channel 9 could be made to deflect so as to impinge on the channel walls. Such impingement inducing deflection is achieved by the turbulent flow described in the aforegoing.

Finally, it should also be underlined that the invention is not limited to the embodiment described in the aforegoing and illustrated in the drawings but that a number of modifications are possible within the scope of the appended claims. For example, the invention is not limited for use in a catalytic converter for purification of the exhaust gases of cars, since the catalyst carrier in accordance with the invention is applicable with the same advantage to all kinds of catalytic converters which are intended for throughflow of gaseous media. Furthermore, it is likewise possible to manufacture the catalyst carrier 3 in accordance with the invention with a different shape than circular. For instance, for space economy reasons it may be advantageous to manufacture it in the shape of a "race track", in which case the core sleeve is replaced by a plate.

Claims

1. A catalyst carrier (3) comprising two webs (6, 7) of material which are wound about a core sleeve in superposed relationship, one (6) of said webs having transverse ridges (8) forming channels (9) which extend axially through the carrier (3), **characterized** therein that the second web (7) of material is formed with lengthwise ribs (10), and that the ridges (8) of the first web (6) are provided both at their tops and at their bottoms with indentations (11) having the same pitch as the ribs (10), the ribs (10) of the second web (7) engaging in said indentations (11), whereby a mechanical bond is established, interlocking the two webs (6, 7).

2. A catalyst carrier as claimed in claim 1,

Fig.1

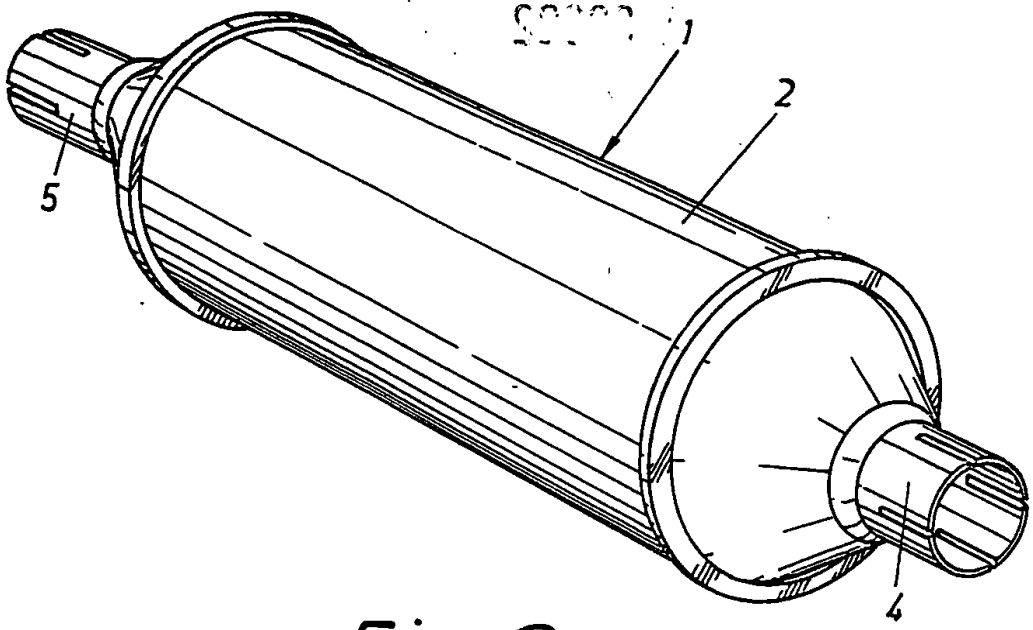
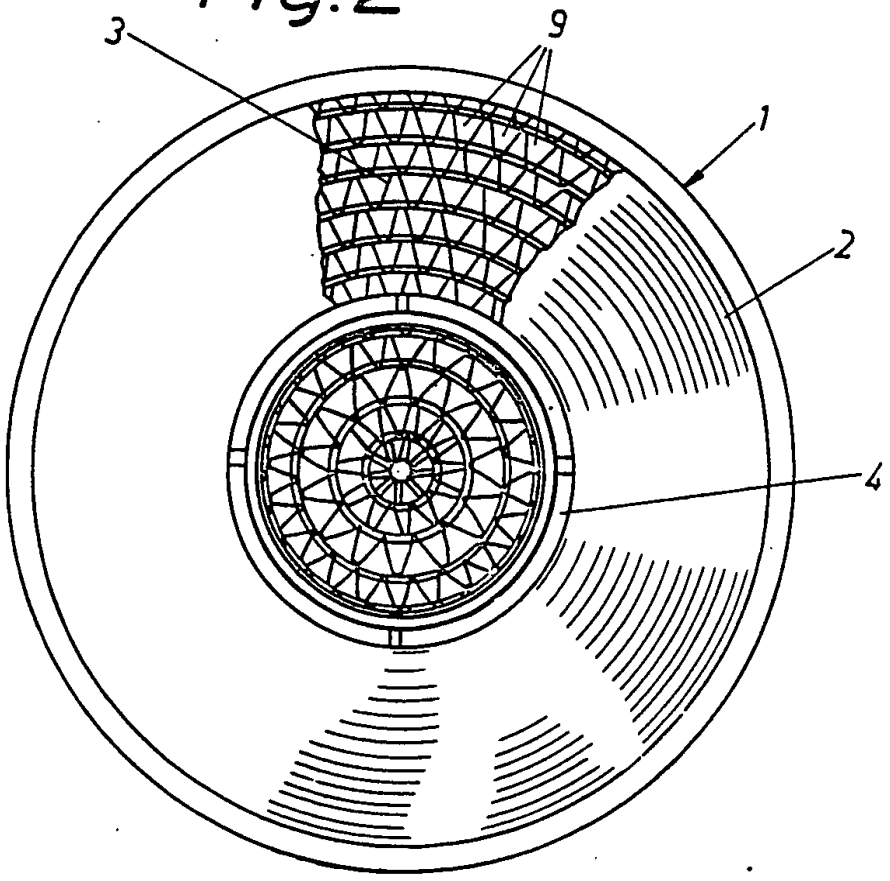


Fig.2



DOCKET NO: E-41365
SERIAL NO: 09/998,724
APPLICANT: Brück

0298943

LERNER AND GREENBERG P.A.
P.O. BOX 2480
HOLLYWOOD, FLORIDA 33022
TEL. (954) 925-1100

Fig.6